

Remarks:

Applicants have carefully studied the second non-final Examiner's Action mailed 12/19/2005, having a shortened statutory period for response that expired 03/19/2006, and having an extended statutory period for response set to expire 05/19/2006, and all references cited therein. The amendment appearing above and these explanatory remarks are believed to be fully responsive to the Action. Accordingly, this important patent application is now believed to be in condition for allowance.

Applicants respond to the outstanding Action by centered headings and numbered paragraphs that correspond to the centered headings and paragraph numbering employed by the Office, to ensure full response on the merits to each finding of the Office.

Response to Arguments

1. Applicants acknowledge that the arguments made in Amendment A are moot in view of the new grounds of rejection.

Drawings

2. Applicants thank the Office for entering and considering the replacement sheet for Fig. 3.

3. The drawings stand objected to under 37 CFR 1.83(a). The Office asserts that the "actuating feature" of claim 1 is not depicted in any drawing. Claim 1 is a cancelled claim so the Office's comment is understood as referring to the "actuating feature" of claim 3. Claim 3 is a method claim and its steps are therefore recited in participle form. The actuating means is the grid depicted in Fig. 6, or an equivalent thereof, as discussed in paragraph [0044] as currently amended and as disclosed in the text that accompanied the drawing when this application was filed. The Office further asserts that the "pump" of claim 5 appears in no drawing and that the "piezo-chamber" of claim 6 appears in no drawing. Said claims 5 and 6 are canceled because they are merely dependent claims and their respective subjects matter are protected by independent claim 3, currently amended.

Specification

4. The disclosure stands objected to because the Office contends that the reference to Boyle's law in paragraph [0030] is in error. Applicants have therefore changed the reference to

Boyle's law in said paragraph and another reference to Boyle's law in paragraph [0011] to the combined gas law.

Claim Rejections – 35 U.S.C. § 112

5. Applicants acknowledge the quotation of 35 U.S.C. § 112, second paragraph.

6. Claims 3-13 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. More particularly, the term "by activating" in claim 3 is deemed to lack sufficient antecedent basis. Moreover, the term "load in fluid communication with said energy reservoir" is deemed "narrative and indefinite, failing to conform with current U.S. practice..." This ground of rejection is respectfully traversed because it is standard, current U.S. practice to describe two structures that are connected to one another with electrical conductors as being "in electrical communication with one another," and to describe two structures that are connected to one another by fluid-carrying pipes or tubes to be "in fluid communication with one another." Claim 3 has been amended in view of the newly found prior art. As currently amended, claim 3 remains in conformity with current U.S. practice.

Claim Rejections – 35 U.S.C. § 102

7. Applicants acknowledge the quotation of 35 U.S.C. § 102(b).

8. Claims 3, 4, and 7-13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Chih-Kang or Bussing. Reconsideration and withdrawal of this ground of rejection is requested for the reasons that follow.

Chih-Kang does not teach or suggest the harnessing of the products of an explosive phase change that occurs in a constant volume chamber as taught and claimed by Applicants. Accordingly, claim 3 is amended to recite the explosive nature of the phase change harnessed by Applicants' invention. Chih-Kang teaches: 1) compression of a refrigerant fluid until said fluid is in a liquid phase; 2) heating the compressed refrigerant fluid until said refrigerant fluid is in a high pressure, vaporized phase; 3) passing the high pressure vaporized refrigerant fluid through a turbine, thereby reducing the pressure of said vaporized fluid; 4) exhausting the reduced pressure vaporized fluid; 5) cooling the reduced pressure vaporized fluid; 6) repeating the process by returning to step 1. Applicants do not employ refrigerant fluids. Moreover, Chih-Kang does not teach or suggest harnessing the effects of an explosive phase change. The phase changes in the Chih-Kung system are non-explosive and in fairness to Applicants, it cannot be said that Applicants followed the teachings and suggestions of Chih-Kang.

Nor does Bussing teach or suggest the harnessing of the products of a phase change of a phase change material that occurs in an explosive manner as taught and claimed by Applicants. Bussing harnesses the effects of an explosion, but the explosion is that of a fuel-air mixture, *i.e.*, the type of explosion that takes place in the cylinders of an internal combustion engine. Claim 3 as currently amended cannot be said, in fairness to Applicants, to describe Applicants' invention and the contribution of Bussing. Applicants are the first, anywhere in the world, to provide phase change materials in a constant volume combustion chamber and to harness the effects of an explosive phase change to produce useful work. By providing such phase change materials, the prior art need to provide combustible fuel-air mixtures to produce an explosion is eliminated. Significantly, Applicants do not provide the pressurized gases until there is a need for said gases. Thus, Applicants' invention does not include a reservoir for compressed gases, refrigerant fluid, fuel-air mixtures, and the like as taught by the prior art.

Claim Rejections – 35 USC § 103

9. Applicants acknowledge the quotation of 35 U.S.C. § 103(a).

10. Claims 3-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chih-Kang or Bussing in view of Mollere or Taylor. Reconsideration and withdrawal of this ground of rejection is requested for the reasons that follow.

Mollere does not harness the effects of an explosion of a combustible mixture of gases to drive a turbine or any other device. The Mollere disclosure relates to a method and apparatus for creating an underwater explosion that simulates an earthquake for research purposes. Specifically, Mollere discloses a combustion chamber having a variable volume that is placed under water and towed by a cable from a ship (col. 4, lines 39-41). An explosion in the combustion chamber "results in an acoustic wave creating the desired seismic impulse." (col. 4, lines 56-60).

At col. 3, lines 8-13, Mollere discloses:

Conventional gas exploders are well described in the technical and patent literature. Any such gas exploded typically includes a variable volume combustion chamber which is represented by dotted lines 12 inside exploder 12. A pressurized fuel or fuel mixture is introduced into combustion chamber 12 which is provided with one or more spark plugs 14 threadedly mounted in a wall of the combustion chamber.

The balance of the Mollere disclosure relates to an improved exhaust valve for such combustion chambers. No suggestion is made concerning the harnessing of the pressure created by the explosion to do useful work. The gases are merely exhausted from the combustion chamber after the desired, acoustic-wave-creating explosion has occurred. Nor are any phase change materials used.

Taylor harnesses the properties of a piezoelectric material to inhibit the growth of barnacles or other marine-dwelling creatures on the hull of a watercraft. A battery supplies energy to the piezoelectric material, causing it to vibrate and thereby preventing organisms from attaching themselves to said vibrating material. When the battery is not operating and the watercraft is traveling through water, the hull flexes and such motion flexes the piezoelectric material attached to the hull so that a trickle current is generated that is suitable for recharging the battery. This highly novel structure, in combination with Chi-Kang, Bussing, and Taylor, teaches away from the harnessing of the effects of an explosion generated by the use of phase change materials.

Applicants' invention, as currently claimed, is clearly not suggested by any combination of Chih-Kang, Bussing, Mollere, or Taylor.

Antecedent basis for claim language relating to the explosive nature of the phase change claimed herein is found in the specification at paragraphs [0030] and [0036]. Antecedent basis for claim language relating to the "on demand" aspect of the claimed invention is found at paragraph [0034] of the specification.

11. Applicants agree that the art made of record and not relied upon is not more pertinent to the claimed invention than the art cited.

12. Applicants have stated in detail where in the original disclosure or drawings the amended claim language finds support.

13. Applicants acknowledge the contact information of the examiner and the SPE.


14. Applicants further acknowledge the contact information for Customer Service.

If the Office is not fully persuaded as to the merits of Applicants' position, or if an Examiner's Amendment would place the pending claims in condition for allowance, a telephone call to the undersigned at (813) 925-8505 is requested. Applicants thank the Office for its careful examination of this important patent application.

Very respectfully,

SMITH & HOPEN

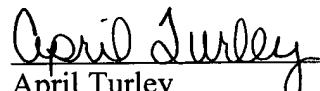
Dated: May 17, 2006
Customer No. 21,901

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CERTIFICATE OF MAILING
(37 C.F.R. § 1.10)

I HEREBY CERTIFY that this Amendment B, including Introductory Comments, Amendments to the Specification, Amendments to the Claims, Amendments to the Drawings and Remarks, is being deposited with the United States Postal Service in an envelope as "Express Mail Post Office to Addressee," mailing Label No. EV917112986US, addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 17, 2006.

Dated: May 17, 2006


April Turley

Amendments to the Drawings:

The attached drawing pages include the following:

Annotated Sheets Showing Changes (Figs. 3, 5 and 6)

Replacement Sheets (Fig. 3, 5 and 6)



FIG. 3

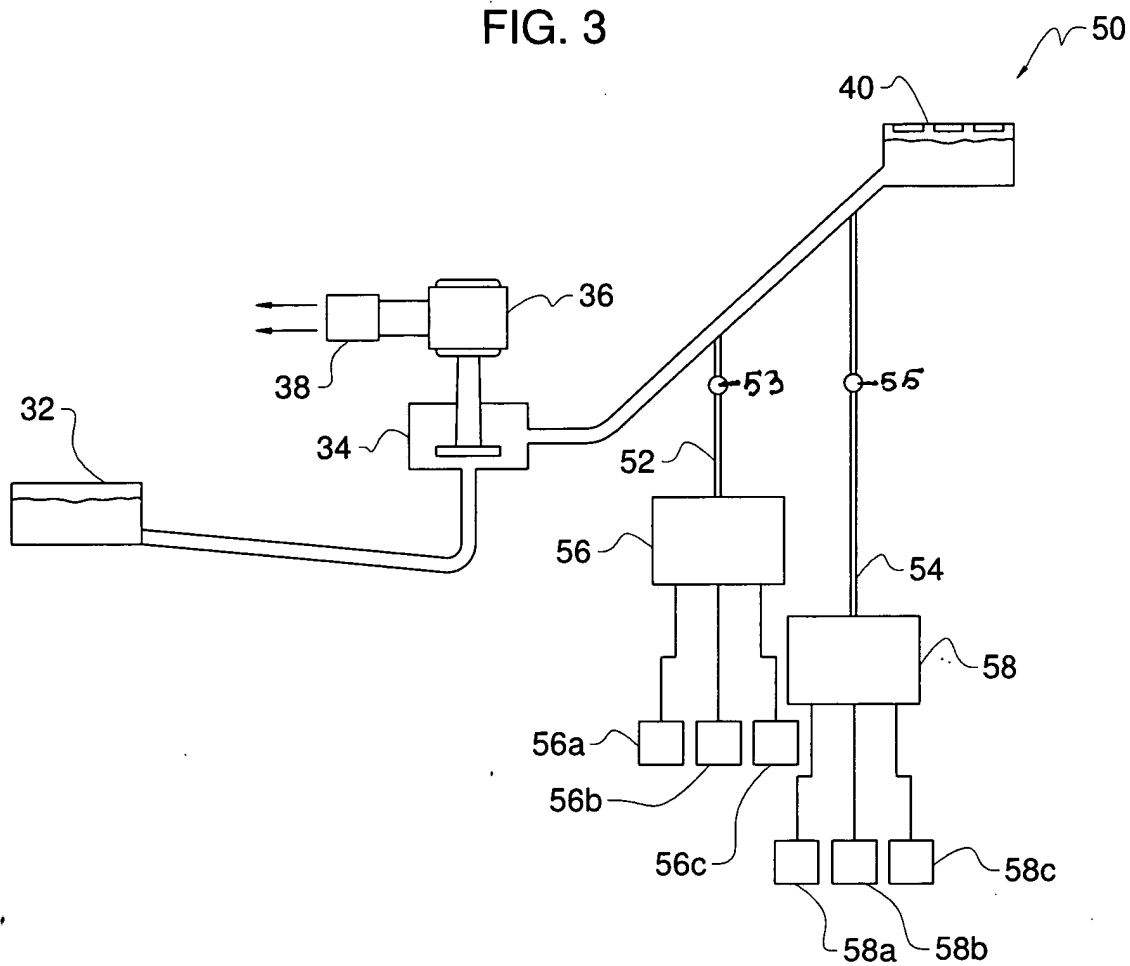


Fig. 5

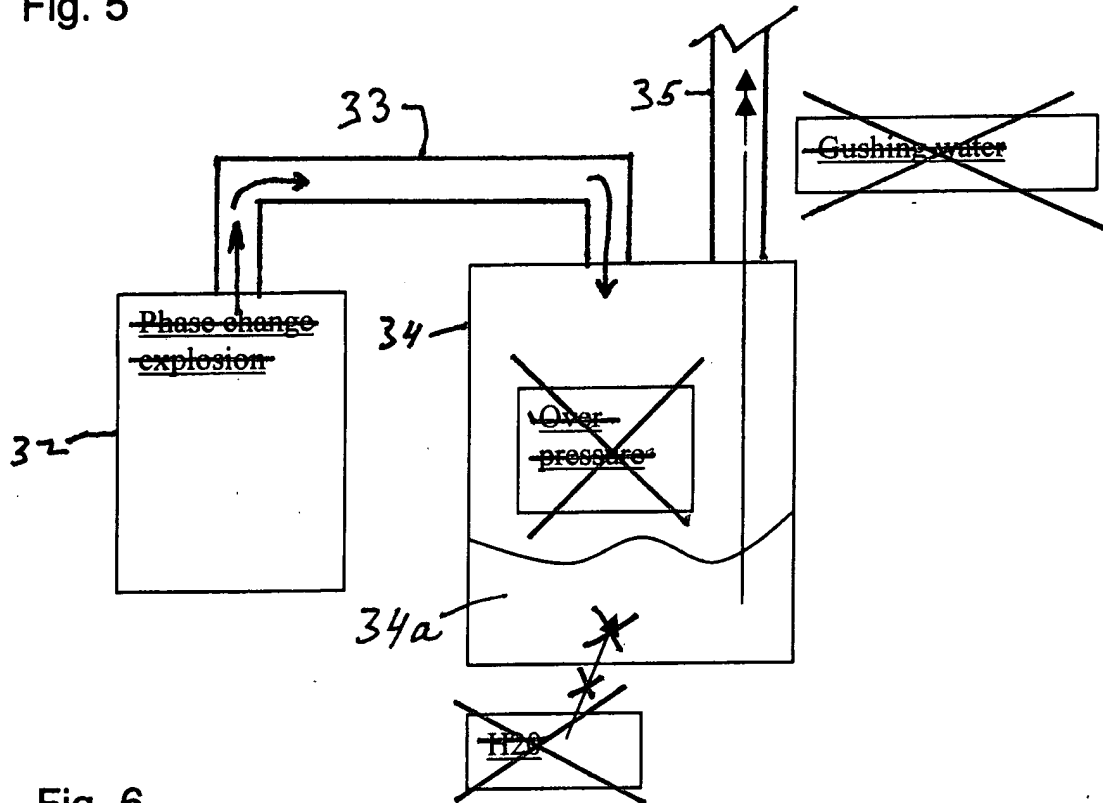


Fig. 6

